



16988 ST25.txt

SEQUENCE LISTING

<110> Zebedee, Suzanne
Inchauspe, Genevieve
Nasoff, Marc S.
Prince, Alfred M.

<120> METHODS AND SYSTEMS FOR PRODUCING RECOMBINANT VIRAL ANTIGENS

<130> 323-100USD

<140> 10/677,956

<141> 2003-10-01

<150> 08/931,855

<151> 1997-09-16

<150> 08/563,733

<151> 1995-11-08

<150> 08/272,271

<151> 1994-07-08

<150> 07/616,369

<151> 1990-11-21

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<160> 76

<170> PatentIn version 3.3

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<222> (16)..(789)

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Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
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tca gaa gga gcc acc cca caa gat tta aac acc atg cta aac aca gtg 195

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
45 50 55 60

ggg gga cat caa gca gcc atg caa atg tta aaa gag acc atc aat gag 243

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 80 85 90
 gca cca ggc cag atg aga gaa cca agg gga agt gac ata gca gga act 339
 Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
 95 100 105
 act agt acc ctt cag gaa caa ata gga tgg atg aca aat aat cca cct 387
 Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
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 atc cca gta gga gaa att tat aaa aga tgg ata atc ctg gga tta aat 435
 Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
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 Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
 190 195 200
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 Gly Val Gly Gly Pro Lys Asn Gln Gln Leu Leu Ser Leu Trp Gly Cys
 225 230 235
 aaa ggg aaa ctt gtt tgt tat act tcc gtt aaa tgg aat gga ccc ggc 771
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 His Lys Ala Arg Val Leu
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35 40 45

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
50 55 60

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65 70 75 80

Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
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Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
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Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
115 120 125

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
130 135 140

Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
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Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
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Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
195 200 205

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210 215 220

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 Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
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ggg gga cat caa gca gcc atg caa atg tta aaa gag acc atc aat gag 243
 Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
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gca cca ggc cag atg aga gaa cca agg gga agt gac ata gca gga act 339
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 95 100 105

act agt acc ctt cag gaa caa ata gga tgg atg aca aat aat cca cct 387
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 Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
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 Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
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acc ttg ttg gtc caa aat gcg aac cca gat tgt aag act att tta aaa 627
 Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
 190 195 200

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gga gta gga gga ccc aaa aat caa caa aga tta aat tta tgg ggg tgt 723
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 225 230 235

aaa ggg aaa ctt att tgt tat act tcc gtt aaa tgg aat gga ccc ggc 771
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cat aag gca aga gtt ttg taataa 795
 His Lys Ala Arg Val Leu
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 35 40 45

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
 50 55 60

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
 65 70 75 80

Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
 85 90 95

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
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Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
 115 120 125

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
 130 135 140

Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
 145 150 155 160

Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
 165 170 175

Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
 180 185 190

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
 195 200 205

Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
 210 215 220

Pro Lys Asn Gln Gln Arg Leu Asn Leu Trp Gly Cys Lys Gly Lys Leu
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Ile Cys Tyr Thr Ser Val Lys Trp Asn Gly Pro Gly His Lys Ala Arg
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Val Leu

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gaa gag aag gct ttc agc cca gaa gtg ata ccc atg ttt tca gca tta 147
 Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
 30 35 40

tca gaa gga gcc acc cca caa gat tta aac acc atg cta aac aca gtg 195
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 45 50 55 60

ggg gga cat caa gca gcc atg caa atg tta aaa gag acc atc aat gag 243
 Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
 65 70 75

gaa gct gca gaa tgg gat aga gtg cat cca gtg cat gca ggg cct att 291
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act agt acc ctt cag gaa caa ata gga tgg atg aca aat aat cca cct Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro 110 115 120			387
atc cca gta gga gaa att tat aaa aga tgg ata atc ctg gga tta aat Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn 125 130 135 140			435
aaa ata gta aga atg tat agc cct acc agc att ctg gac ata aga caa Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln 145 150 155			483
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35

40

45

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
 50 55 60

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
 65 70 75 80

Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
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 100 105 110

Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
 115 120 125

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
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Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
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Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
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 180 185 190

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
 195 200 205

Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
 210 215 220

Pro Gln Asn Gln Gln Leu Leu Asn Leu Trp Gly Cys Arg Gly Lys Ala
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Ile Cys Tyr Thr Ser Val Gln Trp Asn Gly Pro Gly His Lys Ala Arg
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tgg gcg gga tgg ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc      339
Trp Ala Gly Trp Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly
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<212> PRT

<213> Hepatitis C virus

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      35           40           45

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
      50           55           60

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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
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Arg Asn Thr Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly
15 20 25

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Gln Ile Val Gly Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu
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45 50 55 60

aga cgt cag cct atc ccc aag gca cgt cgg ccc gag ggc agg acc tgg 243
Arg Arg Gln Pro Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp
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gct cag ccc ggg tac cct tgg ccc ctc tat ggc aat gag ggt tgc ggc 291
Ala Gln Pro Gly Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly
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16988 ST25.txt

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tgg gcg gga tgg ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc 339
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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
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Arg Arg Arg Ser Arg Asn Leu Gly
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Arg Asn Thr Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly
                15                    20                    25

cag atc gtt ggt gga gtt tac ttg ttg ccg cgc agg ggc cct aga ttg      147
Gln Ile Val Gly Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu
                30                    35                    40

ggt gtg cgc gcg acg agg aag act tcc gag cgg tcg caa cct cga ggt      195
Gly Val Arg Ala Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly
45                    50                    55                    60

aga cgt cag cct atc ccc aag gca cgt cgg tcc gag ggc agg tcc tgg      243
Arg Arg Gln Pro Ile Pro Lys Ala Arg Arg Ser Glu Gly Arg Ser Trp
65                    70                    75

gct cag ccc ggg tac cct tgg ccc ctc tat ggc aat gag ggt tgc ggg      291
Ala Gln Pro Gly Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly
80                    85                    90

tgg gcg gga tgg ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc      339
Trp Ala Gly Trp Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly
95                    100                    105

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Pro Thr Asp Pro Arg Arg Arg Ser Arg Asn Leu Gly
110                    115                    120

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20                    25                    30

Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
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Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
50                    55                    60

Ile Pro Lys Ala Arg Arg Ser Glu Gly Arg Ser Trp Ala Gln Pro Gly
65                    70                    75                    80

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16988 ST25.txt

Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
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Arg Arg Arg Ser Arg Asn Leu Gly
 115 120

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 1 5 10

tcc gtc act gtg tcc cat cct aac atc gag gag gtt gct ctg tcc acc 99
 Ser Val Thr Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr
 15 20 25

acc gga gag atc ccc ttt tac ggc aag gct atc ccc ctc gag gtg atc 147
 Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile
 30 35 40

aag ggg gga aga cat ctc atc ttc tgc cac tca aag aag aag tgc gac 195
 Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp
 45 50 55 60

gag ctc gcc gcg aag ctg gtc gca ttg ggc atc aat gcc gtg gcc tac 243
 Glu Leu Ala Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr
 65 70 75

tac cgc ggt ctt gac gtg tct gtc atc ccg acc agc ggc gat gtt gtc 291
 Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val
 80 85 90

gtc gtg tca acc gat gct ctc atg act ggc ttt acc ggc gac ttc gac 339
 Val Val Ser Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp
 95 100 105

tcg gtg ata gac tgc aat acg ggt acc gag ctc gaa ttc taa 381
 Ser Val Ile Asp Cys Asn Thr Gly Thr Glu Leu Glu Phe
 110 115 120

<210> 16
 <211> 121
 <212> PRT
 <213> Hepatitis C virus

<400> 16

16988 ST25.txt

Met Pro Ile His His His His His His Gly Pro Gly Ser Val Thr Val
 1 5 10 15
 Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu Ile
 20 25 30
 Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly Arg
 35 40 45
 His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala Ala
 50 55 60
 Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly Leu
 65 70 75 80
 Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser Thr
 85 90 95
 Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile Asp
 100 105 110
 Cys Asn Thr Gly Thr Glu Leu Glu Phe
 115 120

<210> 17
 <211> 774
 <212> DNA
 <213> Hepatitis C virus

<220>
 <221> CDS
 <222> (16)..(771)

<400> 17
 aggagggttt ttcatt atg tcc cct ata cta ggt tat tgg aaa att aag ggc 51
 Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly 10
 1 5
 ctt gtg caa ccc act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat 99
 Leu Val Gln Pro Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr 15 20 25
 gaa gag cat ttg tat gag cgc gat gaa ggt gat aaa tgg cga aac aaa 147
 Glu Glu His Leu Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys 30 35 40
 aag ttt gaa ttg ggt ttg gag ttt ccc aat ctt cct tat tat att gat 195
 Lys Phe Glu Leu Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp 45 50 55 60
 ggt gat gtt aaa tta aca cag tct atg gcc atc ata cgt tat ata gct 243
 Gly Asp Val Lys Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala 65 70 75

16988 ST25.txt

gac aag cac aac atg ttg ggt ggt tgt cca aaa gag cgt gca gag att	291
Asp Lys His Asn Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile	
80 85 90	
tca atg ctt gaa gga gcg gtt ttg gat att aga tac ggt gtt tcg aga	339
Ser Met Leu Glu Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg	
95 100 105	
att gca tat agt aaa gac ttt gaa act ctc aaa gtt gat ttt ctt agc	387
Ile Ala Tyr Ser Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser	
110 115 120	
aag cta cct gaa atg ctg aaa atg ttc gaa gat cgt tta tgt cat aaa	435
Lys Leu Pro Glu Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys	
125 130 135 140	
aca tat tta aat ggt gat cat gta acc cat cct gac ttc atg ttg tat	483
Thr Tyr Leu Asn Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr	
145 150 155	
gac gct ctt gat gtt gtt tta tac atg gac cca atg tgc ctg gat gcg	531
Asp Ala Leu Asp Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala	
160 165 170	
ttc cca aaa tta gtt tgt ttt aaa aaa cgt att gaa gct atc cca caa	579
Phe Pro Lys Leu Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln	
175 180 185	
att gat aag tac ttg aaa tcc agc aag tat ata gca tgg cct ttg cag	627
Ile Asp Lys Tyr Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln	
190 195 200	
ggc tgg caa gcc acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat	675
Gly Trp Gln Ala Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp	
205 210 215 220	
ctg gtt ccg cgt gga tcc gac gtc aag ttc ccg ggt ggc ggt cag atc	723
Leu Val Pro Arg Gly Ser Asp Val Lys Phe Pro Gly Gly Gly Gln Ile	
225 230 235	
gtt ggt gga gtt tac ttg ttg ccg cgc agg gaa ttc atc gtg act gac	771
Val Gly Gly Val Tyr Leu Leu Pro Arg Arg Glu Phe Ile Val Thr Asp	
240 245 250	
tga	774

<210> 18
 <211> 252
 <212> PRT
 <213> Hepatitis C virus

<400> 18

Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
1 5 10 15
Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
20 25 30

16988 ST25.txt

Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
35 40 45

Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
50 55 60

Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
65 70 75 80

Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
85 90 95

Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
100 105 110

Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
115 120 125

Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
130 135 140

Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
145 150 155 160

Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
165 170 175

Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
180 185 190

Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
195 200 205

Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
210 215 220

Gly Ser Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val
225 230 235 240

Tyr Leu Leu Pro Arg Arg Glu Phe Ile Val Thr Asp
245 250

<210> 19
<211> 31
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 19
ccaaaattac catatgccaa tcgtgcagaa c 31

<210> 20
<211> 33
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 20
gacccggcca taaggcaaga gttttgtaat aag 33

<210> 21
<211> 34
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 21
gatccttatt acaaaactct tgccttatgg ccgg 34

<210> 22
<211> 28
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 22
gctcgcatat gagcacgatt cccaaacc 28

<210> 23
<211> 32
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 23
gacgaattct taaccctaat tgcgcgacct ac 32

<210> 24
<211> 66
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 24
gatccgacgt caagttcccc ggtggcggtc agatcggttg tggagtttac ttgttgccgc 60

gcaggg

66

<210> 25
 <211> 66
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 25
 aattccctgc gcggcaacaa gtaaactcca ccaacgatct gaccgccacc cgggaacttg 60
 acgtcg 66

<210> 26
 <211> 28
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 26
 ggaattccat atgtccccta tactaggt 28

<210> 27
 <211> 26
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 27
 cggaattctc acctgcgcgg caacaa 26

<210> 28
 <211> 52
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 28
 tatgcctatt catcatcatc atcatcatgg cccgggaatt ctaagtaagt ag 52

<210> 29
 <211> 54
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 29

gatcctactt acttagaatt cccgggccat gatgatgatg atgatgaata ggca

54

<210> 30
 <211> 978
 <212> DNA
 <213> non-A, non-B hepatitis virus

<220>
 <221> CDS
 <222> (1)..(978)
 <223> non-A, non-B hepatitis virus structural antigen

<400> 30
 atg agc acg att ccc aaa cgt caa aga aaa acc aaa cgt aac acc aac 48
 Met Ser Thr Ile Pro Lys Arg Gln Arg Lys Thr Lys Arg Asn Thr Asn
 1 5 10 15

cgt cgc cca cag gac gtc aag ttc ccg ggt ggc ggt cag atc gtt ggt 96
 Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
 20 25 30

gga gtt tac ttg ttg ccg cgc agg ggc cct aga ttg ggt gtg cgc gcg 144
 Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
 35 40 45

acg agg aag act tcc gag cgg tcg caa cct cga ggt aga cgt cag cct 192
 Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
 50 55 60

atc ccc aag gca cgt cgg ccc gag ggc agg acc tgg gct cag ccc ggg 240
 Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
 65 70 75 80

tac cct tgg ccc ctc tat ggc aat gag ggt tgc ggg tgg gcg gga tgg 288
 Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
 85 90 95

ctc ctg tct ccc cgt ggc tct cgg cct agc tgg ggc ccc aca gac ccc 336
 Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
 100 105 110

cgg cgt agg tcg cgc aat ttg ggt aag gtc atc gat acc ctt acg tgc 384
 Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys
 115 120 125

ggc ttc gcc gac ctc atg ggg tac ata ccg ctc gtc ggc gcc cct ctt 432
 Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
 130 135 140

gga ggc gct gcc agg gcc ctg gcg cat ggc gtc cgg gtt ctg gaa gac 480
 Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

ggc gtg aac tat gca aca ggg aac ctt cct ggt tgc tct ttc tct atc 528
 Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

ttc ctt ctg gcc ctg ctc tct tgc ctg act gtg ccc gct tca gcc tac 576
 Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
 180 185 190

16988 ST25.txt

caa gtg cgc aat tcc tcg ggg ctt tac cat gtc acc aat gat tgc cct	624
Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro	
195 200 205	
aac tcg agt gtt gtg tac gag gcg gcc gat gcc atc ctg cac act ccg	672
Asn Ser Ser Val Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro	
210 215 220	
ggg tgt gtc cct tgc gtt cgc gag ggt aac gcc tcg agg tgt tgg gtg	720
Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val	
225 230 235 240	
gcg gtg acc ccc acg gtg gcc acc agg gac ggc aaa ctt ccc aca acg	768
Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr	
245 250 255	
cag ctt cga cgt cat atc gat ctg ctt gtc ggg agc gcc acc ctc tgc	816
Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys	
260 265 270	
tcg gcc ctc tac gtg ggg gac ctg tgc ggg tct gtc ttt ctc gtt ggt	864
Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly	
275 280 285	
caa ctg ttt acc ttc tct ccc agg cgc cac tgg acg acg caa gac tgc	912
Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys	
290 295 300	
aat tgt tct atc tat ccc ggc cat ata acg ggt cat cgc atg gca tgg	960
Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp	
305 310 315 320	
gat atg atg atg aac tgg	978
Asp Met Met Met Asn Trp	
325	

<210> 31
 <211> 948
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for a fusion protein that includes sequences from
 glutathione-S-transferase, non-A, non-B hepatitis virus capsid
 antigen, and a Factor X cleavage site

<220>
 <221> CDS
 <222> (1)..(945)

<400> 31	
atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc	48
Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro	
1 5 10 15	
act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg	96
Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu	
20 25 30	
tat gag cgc gat gaa ggt gat aaa tgg cga aac aaa aag ttt gaa ttg	144
Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu	
35 40 45	

16988 ST25.txt

ggt ttg gag ttt ccc aat ctt cct tat tat att gat ggt gat gtt aaa Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys 50 55 60	192
tta aca cag tct atg gcc atc ata cgt tat ata gct gac aag cac aac Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn 65 70 75 80	240
atg ttg ggt ggt tgt cca aaa gag cgt gca gag att tca atg ctt gaa Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu 85 90 95	288
gga gcg gtt ttg gat att aga tac ggt gtt tcg aga att gca tat agt Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser 100 105 110	336
aaa gac ttt gaa act ctc aaa gtt gat ttt ctt agc aag cta cct gaa Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu 115 120 125	384
atg ctg aaa atg ttc gaa gat cgt tta tgt cat aaa aca tat tta aat Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn 130 135 140	432
ggt gat cat gta acc cat cct gac ttc atg ttg tat gac gct ctt gat Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp 145 150 155 160	480
gtt gtt tta tac atg gac cca atg tgc ctg gat gcg ttc cca aaa tta Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu 165 170 175	528
gtt tgt ttt aaa aaa cgt att gaa gct atc cca caa att gat aag tac Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr 180 185 190	576
ttg aaa tcc agc aag tat ata gca tgg cct ttg cag ggc tgg caa gcc Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala 195 200 205	624
acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat ctg atc gaa ggt Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Ile Glu Gly 210 215 220	672
cgt ggg atc ccc aat tcg agc tcg gta ccc atg agc acg att ccc aaa Arg Gly Ile Pro Asn Ser Ser Val Pro Met Ser Thr Ile Pro Lys 225 230 235 240	720
cct caa aga aaa acc aaa cgt aac acc aac cgt cgc cca cag gac gtc Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp Val 245 250 255	768
aag ttc ccg ggt ggc ggt cag atc gtt ggt gga gtt tac ttg ttg ccg Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val Tyr Leu Leu Pro 260 265 270	816
cgc agg ggc cct aga ttg ggt gtg cgc gcg acg agg aag act tcc gag Arg Arg Gly Pro Arg Leu Gly Val Arg Ala Thr Arg Lys Thr Ser Glu 275 280 285	864
cgg tcg caa cct cga ggt aga cgt cag cct atc ccc aag gca cgt cgg Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys Ala Arg Arg 290 295 300	912

290

295

ccc gag ggc agg acg ggg atc ggg aat tca tgc tga
Pro Glu Gly Arg Thr Gly Ile Gly Asn Ser Ser
305 310 315

948

<210> 32
<211> 21
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 32
atgagcacga ttcccaaacc t

21

<210> 33
<211> 17
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 33
gaggaagact tccgagc

17

<210> 34
<211> 17
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 34
gtcctgccct cgggccg

17

<210> 35
<211> 21
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 35
acccaaattg cgcgacctac g

21

<210> 36
<211> 19
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 36
tgggtaaggt catcgatac 19

<210> 37
<211> 17
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 37
aaggtcatcg ataccct 17

<210> 38
<211> 18
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 38
agatagagaa agagcaac 18

<210> 39
<211> 22
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 39
ggaccagttc atcatcatat at 22

<210> 40
<211> 20
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide

<400> 40
cagttcatca tcatatccca 20

<210> 41
<211> 5
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 41

Gly Ile Pro Asn Ser
1 5

<210> 42
<211> 15
<212> DNA
<213> Artificial

<220>
<223> Codes for linker protein in GST-NANBV 693-691

<220>
<221> CDS
<222> (1)..(15)

<400> 42
ggg atc ccc aat tca
Gly Ile Pro Asn Ser
1 5

15

<210> 43
<211> 3
<212> PRT
<213> Artificial

<220>
<223> Carboxy-terminal linker protein in GST-NANBV 693-691

<400> 43

Asn Ser Ser
1

<210> 44
<211> 12
<212> DNA
<213> Artificial

<220>
<223> Codes for carboxy-terminal linker protein in GST-NANBV 693-691

<220>
<221> CDS
<222> (1)..(9)

<400> 44
aat tca tcg tga
Asn Ser Ser
1

12

<210> 45
<211> 9
<212> PRT
<213> Artificial

<220>
<223> Linker protein in GST-NANBV 15-18

<400> 45

Gly Ile Pro Ile Glu Phe Leu Gln Pro
 1 5

<210> 46

<211> 27

<212> DNA

<213> Artificial

<220>

<221> CDS

<222> (1)..(27)

<223> Codes for linker protein in GST-NANBV 15-18

<400> 46

ggg atc ccc atc gaa ttc ctg cag ccc
 Gly Ile Pro Ile Glu Phe Leu Gln Pro
 1 5

27

<210> 47

<211> 7

<212> PRT

<213> Artificial

<220>

<223> Carboxy-terminal linker protein in GST-NANBV 15-18

<400> 47

Trp Gly Ile Gly Asn Ser Ser
 1 5

<210> 48

<211> 24

<212> DNA

<213> Artificial

<220>

<223> Codes for carboxy-terminal linker protein in GST-NANBV 15-18

<220>

<221> CDS

<222> (1)..(21)

<400> 48

tgg ggg atc ggg aat tca tcg tga
 Trp Gly Ile Gly Asn Ser Ser
 1 5

24

<210> 49

<211> 8

<212> PRT

<213> Artificial

<220>

<223> Linker protein in GST-NANBV 15-17

<400> 49

Gly Ile Pro Asn Ser Cys Ser Pro
 1 5

<210> 50
 <211> 24
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for linker protein in GST-NANBV 15-17

<220>
 <221> CDS
 <222> (1)..(24)

<400> 50
 ggg atc ccc aat tcc tgc agc cct
 Gly Ile Pro Asn Ser Cys Ser Pro
 1 5

24

<210> 51
 <211> 6
 <212> PRT
 <213> Artificial

<220>
 <223> Carboxy-terminal linker protein in GST-NANBV 15-17

<400> 51

Gly Ile Gly Asn Ser Ser
 1 5

<210> 52
 <211> 21
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for carboxy-terminal linker protein in GST-NANBV 15-17

<220>
 <221> CDS
 <222> (1)..(18)

<400> 52
 ggg atc ggg aat tca tcg tga
 Gly Ile Gly Asn Ser Ser
 1 5

21

<210> 53
 <211> 5
 <212> PRT
 <213> Artificial

<220>
 <223> Thrombin cleavage site in GST-NANBV 15-17
 <400> 53

Val Pro Arg Gly Ser
 1 5

<210> 54
 <211> 15
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for thrombin cleavage site in GST-NANBV 15-17

<220>
 <221> CDS
 <222> (1)..(15)

<400> 54
 gtt ccg cgt gga tcc
 Val Pro Arg Gly Ser
 1 5

15

<210> 55
 <211> 7
 <212> PRT
 <213> Artificial

<220>
 <223> Linker protein in GST-NANBV 15-17

<400> 55

Pro Ser Asn Ser Cys Ser Pro
 1 5

<210> 56
 <211> 21
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for linker protein in GST-NANBV 15-17

<220>
 <221> CDS
 <222> (1)..(21)

<400> 56
 cca tcg aat tcc tgc agc cct
 Pro Ser Asn Ser Cys Ser Pro
 1 5

21

<210> 57

<211> 5
 <212> PRT
 <213> Artificial

<220>
 <223> Carboxy-terminal linker protein in GST-NANBV 15-17

<400> 57

Gly Ile His Arg Asp
 1 5

<210> 58
 <211> 18
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for carboxy-terminal linker protein in GST-NANBV 15-17

<220>
 <221> CDS
 <222> (1)..(15)

<400> 58
 gga att cat cgt gac tga
 Gly Ile His Arg Asp
 1 5

18

<210> 59
 <211> 9
 <212> PRT
 <213> Artificial

<220>
 <223> Linker protein in GST-NANBV 690-691

<400> 59

Gly Ile Pro Asn Ser Ser Ser Val Pro
 1 5

<210> 60
 <211> 27
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for linker protein in GST-NANBV 690-691

<220>
 <221> CDS
 <222> (1)..(27)

<400> 60
 ggg atc ccc aat tcg agc tcg gta ccc
 Gly Ile Pro Asn Ser Ser Ser Val Pro
 1 5

27

<210> 61
 <211> 7
 <212> PRT
 <213> Artificial

<220>
 <223> Carboxy-terminal linker protein in GST-NANBV 690-691

<400> 61

Thr Gly Ile Gly Asn Ser Ser
 1 5

<210> 62
 <211> 24
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for carboxy-terminal linker protein in GST-NANBV 690-691

<220>
 <221> CDS
 <222> (1)..(21)

<400> 62
 acg ggg atc ggg aat tca tcg tga 24
 Thr Gly Ile Gly Asn Ser Ser
 1 5

<210> 63
 <211> 66
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 63
 gatccatgag cacgattccc aaacctcaaa gaaaaaccaa acgtaacacc aaccgtcgcc 60
 cacagg 66

<210> 64
 <211> 66
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 64
 aattcctgtg ggggacgggtt ggtgttacgt ttggtttttc tttgagggtt gggaatcgtg 60
 ctcatg 66

<210> 65
 <211> 759
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for a fusion protein that includes sequences from
 glutathione-S-transferase, non-A, non-B hepatitis virus capsid
 antigen, and a thrombin cleavage site

<220>
 <221> CDS
 <222> (1)..(756)

<400> 65
 atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc 48
 Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
 1 5 10 15
 act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg 96
 Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
 20 25 30
 tat gag cgc gat gaa ggt gat aaa tgg cga aac aaa aag ttt gaa ttg 144
 Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45
 ggt ttg gag ttt ccc aat ctt cct tat tat att gat ggt gat gtt aaa 192
 Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60
 tta aca cag tct atg gcc atc ata cgt tat ata gct gac aag cac aac 240
 Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80
 atg ttg ggt ggt tgt cca aaa gag cgt gca gag att tca atg ctt gaa 288
 Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95
 gga gcg gtt ttg gat att aga tac ggt gtt tcg aga att gca tat agt 336
 Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110
 aaa gac ttt gaa act ctc aaa gtt gat ttt ctt agc aag cta cct gaa 384
 Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
 115 120 125
 atg ctg aaa atg ttc gaa gat cgt tta tgt cat aaa aca tat tta aat 432
 Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
 130 135 140
 ggt gat cat gta acc cat cct gac ttc atg ttg tat gac gct ctt gat 480
 Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
 145 150 155 160
 gtt gtt tta tac atg gac cca atg tgc ctg gat gcg ttc cca aaa tta 528
 Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
 165 170 175
 gtt tgt ttt aaa aaa cgt att gaa gct atc cca caa att gat aag tac 576
 Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
 180 185 190

16988 ST25.txt

ttg aaa tcc agc aag tat ata gca tgg cct ttg cag ggc tgg caa gcc 624
 Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
 195 200 205

acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat ctg gtt ccg cgt 672
 Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
 210 215 220

gga tcc atg agc acg att ccc aaa cct caa aga aaa acc aaa cgt aac 720
 Gly Ser Met Ser Thr Ile Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn
 225 230 235 240

acc aac cgt cgc cca cag gaa ttc atc gtg act gac tga 759
 Thr Asn Arg Arg Pro Gln Glu Phe Ile Val Thr Asp
 245 250

<210> 66
 <211> 66
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 66
 gatccgacgt caagttcgcg ggtggcggtc agatcgttgg tggagtttac ttgttgccgc 60
 gcaggg 66

<210> 67
 <211> 66
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 67
 aattccctgc gcggcaacaa gtaaaactcca ccaacgatct gaccgccacc cggaacttg 60
 acgtcg 66

<210> 68
 <211> 759
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for a fusion protein that includes sequences from
 glutathione-S-transferase, non-A, non-B hepatitis virus capsid
 antigen, and a thrombin cleavage site.

<220>
 <221> CDS
 <222> (1)..(756)

<400> 68
 atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc 48
 Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro

1	5	10	15	
act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg	Thr Arg Leu 20	Leu Glu Tyr 25	Glu Lys Tyr 30	96
tat gag cgc gat gaa ggt gat aaa tgg cga aac aaa aag ttt gaa ttg	Tyr Glu Arg 35	Asp Glu Gly Asp 40	Lys Trp Arg Asn Lys 45	144
ggt ttg gag ttt ccc aat ctt cct tat tat att gat ggt gat gtt aaa	Gly Leu 50	Glu Phe Pro Asn 55	Pro Tyr Tyr Ile 60	192
tta aca cag tct atg gcc atc ata cgt tat ata gct gac aag cac aac	Leu Thr Gln Ser Met 70	Ala Ile Ile Arg Tyr 75	Ile Ala Asp Lys His 80	240
atg ttg ggt ggt tgt cca aaa gag cgt gca gag att tca atg ctt gaa	Met Leu Gly 85	Gly Cys Pro Lys Glu Arg 90	Ala Glu Ile Ser Met 95	288
gga gcg gtt ttg gat att aga tac ggt gtt tcg aga att gca tat agt	Gly Ala Val 100	Asp Ile Arg Tyr 105	Val Ser Arg Ile 110	336
aaa gac ttt gaa act ctc aaa gtt gat ttt ctt agc aag cta cct gaa	Lys Asp Phe 115	Val Glu Thr Leu Lys 120	Val Asp Phe Leu Ser 125	384
atg ctg aaa atg ttc gaa gat cgt tta tgt cat aaa aca tat tta aat	Met Leu Lys 130	Met Phe Glu Asp Arg 135	Leu Cys His Lys Thr 140	432
ggt gat cat gta acc cat cct gac ttc atg ttg tat gac gct ctt gat	Gly Asp His Val Thr 150	His Pro Asp Phe Met 155	Tyr Asp Ala Leu 160	480
gtt gtt tta tac atg gac cca atg tgc ctg gat gcg ttc cca aaa tta	Val Val Leu Tyr 165	Met Asp Pro Met Cys 170	Leu Asp Ala Phe Pro 175	528
gtt tgt ttt aaa aaa cgt att gaa gct atc cca caa att gat aag tac	Val Cys Phe Lys 180	Lys Arg Ile Glu Ala 185	Ile Pro Gln Ile 190	576
ttg aaa tcc agc aag tat ata gca tgg cct ttg cag ggc tgg caa gcc	Leu Lys Ser Ser Lys Tyr Ile 200	Ala Trp Pro Leu Gln 205	Gly Trp Gln Ala 210	624
acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat ctg gtt ccg cgt	Thr Phe 210	Gly Gly Gly Asp His 215	Pro Pro Lys Ser 220	672
gga tcc gac gtc aag ttc ccg ggt ggc ggt cag atc gtt ggt gga gtt	Gly Ser Asp Val Lys Phe Pro 230	Gly Gly Gly Gln Ile Val 235	Gly Gly Val 240	720
tac ttg ttg ccg cgc agg gaa ttc atc gtg act gac tga	Tyr Leu Leu Pro Arg 245	Arg Arg Glu Phe Ile 250	Val Thr Asp	759

<210> 69
 <211> 32
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 69
 gaattcttac ctgcgcgga acaagtaaac tc 32

<210> 70
 <211> 32
 <212> DNA
 <213> Artificial

<220>
 <223> synthetic oligonucleotide

<400> 70
 gctggatcca gcacgattcc caaacctcaa ag 32

<210> 71
 <211> 816
 <212> DNA
 <213> Artificial

<220>
 <223> Codes for a fusion protein that includes sequences from
 glutathione-S-transferase, non-A, non-B hepatitis virus capsid
 antigen, and a thrombin cleavage site

<220>
 <221> CDS
 <222> (1)..(813)

<400> 71
 atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc 48
 Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
 1 5 10 15

act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg 96
 Thr Arg Leu Leu Leu Glu Tyr Leu Glu Lys Tyr Glu Glu His Leu
 20 25 30

tat gag cgc gat gaa ggt gat aaa tgg cga aac aaa aag ttt gaa ttg 144
 Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45

ggt ttg gag ttt ccc aat ctt cct tat tat att gat ggt gat gtt aaa 192
 Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60

tta aca cag tct atg gcc atc ata cgt tat ata gct gac aag cac aac 240
 Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80

atg ttg ggt ggt tgt cca aaa gag cgt gca gag att tca atg ctt gaa 288
 Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95

16988 ST25.txt

gga gcg gtt ttg gat att aga tac ggt gtt tcg aga att gca tat agt 336
 Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110
 aaa gac ttt gaa act ctc aaa gtt gat ttt ctt agc aag cta cct gaa 384
 Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
 115 120 125
 atg ctg aaa atg ttc gaa gat cgt tta tgt cat aaa aca tat tta aat 432
 Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
 130 135 140
 ggt gat cat gta acc cat cct gac ttc atg ttg tat gac gct ctt gat 480
 Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
 145 150 155 160
 gtt gtt tta tac atg gac cca atg tgc ctg gat gcg ttc cca aaa tta 528
 Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
 165 170 175
 gtt tgt ttt aaa aaa cgt att gaa gct atc cca caa att gat aag tac 576
 Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
 180 185 190
 ttg aaa tcc agc aag tat ata gca tgg cct ttg cag ggc tgg caa gcc 624
 Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
 195 200 205
 acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat ctg gtt ccg cgt 672
 Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
 210 215 220
 gga tcc agc acg att ccc aaa cct caa aga aaa acc aaa cgt aac acc 720
 Gly Ser Ser Thr Ile Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr
 225 230 235 240
 aac cgt cgc cca cag gac gtc aag ttc ccg ggt ggc ggt cag atc gtt 768
 Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val
 245 250 255
 ggt gga gtt tac ttg ttg ccg cgc agg gaa ttc atc gtg act gac tga 816
 Gly Gly Val Tyr Leu Leu Pro Arg Arg Glu Phe Ile Val Thr Asp
 260 265 270

<210> 72
 <211> 271
 <212> PRT
 <213> Artificial

<220>
 <223> Synthetic Construct

<400> 72

Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
1 5 10 15

Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
20 25 30

16988 ST25.txt

Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45
 Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60
 Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80
 Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95
 Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110
 Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
 115 120 125
 Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
 130 135 140
 Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
 145 150 155 160
 Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
 165 170 175
 Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
 180 185 190
 Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
 195 200 205
 Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
 210 215 220
 Gly Ser Ser Thr Ile Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn Thr
 225 230 235 240
 Asn Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val
 245 250 255
 Gly Gly Val Tyr Leu Leu Pro Arg Arg Glu Phe Ile Val Thr Asp
 260 265 270

<210> 73
 <211> 326

<212> PRT

<213> non-A, non-B hepatitis virus

<400> 73

Met Ser Thr Ile Pro Lys Arg Gln Arg Lys Thr Lys Arg Asn Thr Asn
 1 5 10 15

Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
 20 25 30

Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
 35 40 45

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
 50 55 60

Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro Gly
 65 70 75 80

Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Cys Gly Trp Ala Gly Trp
 85 90 95

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Thr Asp Pro
 100 105 110

Arg Arg Arg Ser Arg Asn Leu Gly Lys Val Ile Asp Thr Leu Thr Cys
 115 120 125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Leu Val Gly Ala Pro Leu
 130 135 140

Gly Gly Ala Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

Gly Val Asn Tyr Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Leu Thr Val Pro Ala Ser Ala Tyr
 180 185 190

Gln Val Arg Asn Ser Ser Gly Leu Tyr His Val Thr Asn Asp Cys Pro
 195 200 205

Asn Ser Ser Val Val Tyr Glu Ala Ala Asp Ala Ile Leu His Thr Pro
 210 215 220

Gly Cys Val Pro Cys Val Arg Glu Gly Asn Ala Ser Arg Cys Trp Val
 225 230 235 240

Ala Val Thr Pro Thr Val Ala Thr Arg Asp Gly Lys Leu Pro Thr Thr
 245 250 255

Gln Leu Arg Arg His Ile Asp Leu Leu Val Gly Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Ser Val Phe Leu Val Gly
 275 280 285

Gln Leu Phe Thr Phe Ser Pro Arg Arg His Trp Thr Thr Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly His Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320

Asp Met Met Met Asn Trp
 325

<210> 74
 <211> 315
 <212> PRT
 <213> Artificial

<220>
 <223> Synthetic Construct

<400> 74

Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
 1 5 10 15

Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
 20 25 30

Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45

Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60

Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80

Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95

Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110

16988 ST25.txt

Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
115 120 125

Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
130 135 140

Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
145 150 155 160

Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
165 170 175

Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
180 185 190

Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
195 200 205

Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Ile Glu Gly
210 215 220

Arg Gly Ile Pro Asn Ser Ser Ser Val Pro Met Ser Thr Ile Pro Lys
225 230 235 240

Pro Gln Arg Lys Thr Lys Arg Asn Thr Asn Arg Arg Pro Gln Asp Val
245 250 255

Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val Tyr Leu Leu Pro
260 265 270

Arg Arg Gly Pro Arg Leu Gly Val Arg Ala Thr Arg Lys Thr Ser Glu
275 280 285

Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro Ile Pro Lys Ala Arg Arg
290 295 300

Pro Glu Gly Arg Thr Gly Ile Gly Asn Ser Ser
305 310 315

<210> 75
<211> 252
<212> PRT
<213> Artificial

<220>
<223> Synthetic Construct

<400> 75

16988 ST25.txt

Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
 1 5 10 15
 Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
 20 25 30
 Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45
 Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60
 Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80
 Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95
 Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110
 Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
 115 120 125
 Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
 130 135 140
 Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
 145 150 155 160
 Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
 165 170 175
 Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
 180 185 190
 Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
 195 200 205
 Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
 210 215 220
 Gly Ser Met Ser Thr Ile Pro Lys Pro Gln Arg Lys Thr Lys Arg Asn
 225 230 235 240
 Thr Asn Arg Arg Pro Gln Glu Phe Ile Val Thr Asp
 245 250

<210> 76
 <211> 252
 <212> PRT
 <213> Artificial

<220>
 <223> Synthetic Construct

<400> 76

Met Ser Pro Ile Leu Gly Tyr Trp Lys Ile Lys Gly Leu Val Gln Pro
 1 5 10 15

Thr Arg Leu Leu Leu Glu Tyr Leu Glu Glu Lys Tyr Glu Glu His Leu
 20 25 30

Tyr Glu Arg Asp Glu Gly Asp Lys Trp Arg Asn Lys Lys Phe Glu Leu
 35 40 45

Gly Leu Glu Phe Pro Asn Leu Pro Tyr Tyr Ile Asp Gly Asp Val Lys
 50 55 60

Leu Thr Gln Ser Met Ala Ile Ile Arg Tyr Ile Ala Asp Lys His Asn
 65 70 75 80

Met Leu Gly Gly Cys Pro Lys Glu Arg Ala Glu Ile Ser Met Leu Glu
 85 90 95

Gly Ala Val Leu Asp Ile Arg Tyr Gly Val Ser Arg Ile Ala Tyr Ser
 100 105 110

Lys Asp Phe Glu Thr Leu Lys Val Asp Phe Leu Ser Lys Leu Pro Glu
 115 120 125

Met Leu Lys Met Phe Glu Asp Arg Leu Cys His Lys Thr Tyr Leu Asn
 130 135 140

Gly Asp His Val Thr His Pro Asp Phe Met Leu Tyr Asp Ala Leu Asp
 145 150 155 160

Val Val Leu Tyr Met Asp Pro Met Cys Leu Asp Ala Phe Pro Lys Leu
 165 170 175

Val Cys Phe Lys Lys Arg Ile Glu Ala Ile Pro Gln Ile Asp Lys Tyr
 180 185 190

Leu Lys Ser Ser Lys Tyr Ile Ala Trp Pro Leu Gln Gly Trp Gln Ala
 195 200 205

16988 ST25.txt

Thr Phe Gly Gly Gly Asp His Pro Pro Lys Ser Asp Leu Val Pro Arg
 210 215 220

Gly Ser Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly Gly Val
 225 230 235 240

Tyr Leu Leu Pro Arg Arg Glu Phe Ile Val Thr Asp
 245 250